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Reserve

## Land Use

## Planning Assistance

available through the

United States

Department of Agriculture

Cover—LAND USE PLANNING is cooperation in action. Individuals representing groups with common objectives sit down together to study inventory data available from the U.S. Department of Agriculture and arrive at compromise solutions to land use problems.



## THE DEPARTMENT'S LAND USE POLICY

The United States Department of Agriculture administers more than 80 programs that influence land use decisions made by landholders. This publication describes these programs for the reference use of local, county and State people whose decisions can affect land use patterns and trends.

Fifty-eight percent of America's land is in private hands, with 75 percent of that acreage owned by farmers and ranchers. Another 8 percent is in National Forests and National Grasslands managed by the Department. Six percent of the Nation's land is owned by State or local governments.

The Department recognizes that local and State governments have the major responsibility for land use policy, both in planning and regulation. The Department also recognizes the rights and responsibilities of landowners and users in making land use decisions within this framework.

Land, water, and air are basic assets to be used and managed wisely in order to protect, conserve and enhance their productivity and quality for the benefit of all Americans. Increased public interest in these basic assets calls for an effective planning and decision making mechanism that complements responsibilities of local governments for determining land use limitations. The Nation must meet the challenge of reconciling competing uses for land and mini-

DEC 4 1974

mizing the impacts of such uses on water and air to assure the maximum possible benefits to the Nation.

The Department's programs offering research, educational, technical, and financial assistance reach every county and State of the Nation. Its agencies now assist all levels of government in land use planning and implementation efforts.

This publication summarizes briefly: (1) the *purposes* of each of the principal Department programs which influence land use, and (2) the *land use application* of that particular program. The Department's nationwide delivery system for making this land use information available includes the several thousand county offices of its various agencies, 3,000 conservation districts, research centers of the State Land Grant Universities, and State Agriculture Departments.

We invite you to use the Department's storehouse of land use information. If needed, the Department can obtain additional facts and interpretations through research findings and deliver them through established education and action programs. Its technical, consultive and financial assistance programs are available to local and State units of government.

Earl L. Butz  
Secretary of Agriculture

Issued February 1974

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## U.S. Department of Agriculture Offers Land Use Planning Assistance

Individuals, groups, organizations, cities and towns, and county and State governments can readily avail themselves of the many programs and services offered by the United States Department of Agriculture. These programs benefit land use planners because they either furnish inventory data on natural resources—soil, water, and the plants and animals occurring on the surface of land areas—or else make available a wide range of advisory, financial, or technical assistance.

The Department's long established programs originally were designed to meet the needs of the Nation's farmers and ranchers. However, in recent years the demand for similar services in nonfarm and urban sectors has resulted in an expansion of some of the Department's programs to serve individuals residing and groups working in those areas. Typical on-site or consulting services now provided in nonfarm rural land and metropolitan areas include conservation and development of water supplies; establishment and maintenance of parks, forests, shade tree plantings, and outdoor recreation areas; protection of trees from insects and diseases; retention of open space, greenbelt areas, and scenery; preservation of wilderness areas; and development of favorable habitats for fish and wildlife. Trained specialists within the Department, working cooperatively with existing State and county organizations, can provide the technical know-how to solve these and other land-use problems.

After reviewing the descriptions of available programs included in this booklet, you may wish to call or visit your local county, State USDA, land grant university, or conservation district office for more specific information. At these locations you can obtain information of the type listed on the inside back cover. Principal USDA agencies that can furnish inventory data or provide assistance through supporting programs and services are listed on the back cover.



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## Section I

Programs that provide

# Inventories of Lands and Natural Resources

BASIC TO ALL LAND USE planning is soil survey, which classifies soils according to a nationwide system. Soil information is interpreted for many different kinds of land use.



## Information About Resources

If our efforts to provide a harmonious and enjoyable environment are to be successful, we need accurate information about the location and condition of land and water resources. A national inventory of our country's lands, identified as to land type, acreage and condition, is essential in establishing workable land use policies. The Department obtains these types of inventory data through several active programs on a variety of subjects related to land use.

The USDA-sponsored National Inventory of Soil and Water Conservation needs, updated in 1967, provides basic information about the privately owned rural land that comprises 58 percent of our Nation's land area. Data on the publicly owned lands, which make up one third of our country's acreage, are summarized and analyzed in the 1970 report of the Public Land Law Review Commission. Together, these two published documents present a comprehensive inventory of the Nation's total land resources. In addition, the National Water Assessment by the Water Resources Council, required by the Water Resources Planning Act of 1965, gives a comparable picture of the Nation's water resources.

These published and current field surveys provide basic and timely information for the many Departmental programs which directly assist land owners. The same information can be used in several ways by other federal agencies, municipal, county or State governments, and private industries and associations in making land use allocations and decisions. This section briefly describes the Department's continuing programs that are being carried on daily to obtain accurate data on the acreage and condition of the country's total natural resource base. Land use planners can tap this pipeline of useful information by consulting the nearest USDA office—usually that of the county agent.





## **SURVEYS TO DETERMINE ACREAGES AND CONSERVATION CONDITIONS.**

### **Soil Surveys**

**Purpose:** To determine the potentials and use limitations of the Nation's soil resources; to determine the physical and chemical properties of soils; to classify unique soil types and locate their boundaries on maps; to assemble data on soil behavior from research and field experience; to predict the behavior of soils for specified land uses; to publish soil survey maps for States and counties; and to provide leadership for the National Cooperative Soil Survey.

**Land Use Application:** Appraises the effects of alternative land uses on the environment and on the net productivity of the land resource; evaluates soil hazards and suitability for: (a) farm and rural uses such as selection of kinds and varieties of crops, management practices, and yield predictions; (b) non-farm uses including location, design, and expected performance of local roads, streets, low buildings, septic tank filter fields, sewage lagoons, sanitary land fills, and reservoirs; (c) forestry, recreation, and wildlife uses; (d) location of



**OHIO FARM REPRESENTS** desirable and pleasing combination of approved conservation practices, installed with technical assistance of the U.S. Department of Agriculture. Full-time farmer operates dairy and does general farming, belongs to local conservation district. Farm pond in foreground and stock watering tank at right are special features. Farmstead adjoins woodland area.

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source material for gravel, sand, topsoil, and roadfill; (e) miscellaneous non-farm uses, including shopping centers, housing subdivisions, and industrial parks.

### **Watershed Surveys and Investigations**

**Purpose:** To inventory present uses and determine potential future uses of land and water resources, which include identification of (a) resource problems and possible solutions, (b) the natural resource base and environmental setting, (c) the economic base, (d) opportunities for economic and environmental enhancement, and (e) potentials for assistance from public programs.

**Land Use Application:** Provides basic information and alternative plans for using land and water resources within their capabilities and potentials. State agencies can consult reports from river basin studies in preparing their



**AERIAL PHOTOS** here are used as base map for direct entry of soil survey data obtained by soil scientist. Location of soil can be indicated accurately.

State water plans. Local people can coordinate data from these reports for such purposes as (1) implementing land and water resource programs, (2) developing recreational and environmental stream-corridor systems as parts of land use plans, and (3) identifying areas that have flood hazards.

### **Snow Surveys and Forecasting of Water Supplies**

**Purpose:** To provide water supply forecasts to city, power, industrial, domestic, and agricultural water users of the Western States so that they can plan for more efficient water management. (Program currently operational in 11 Western States and Alaska).

**Land Use Application:** In the West most of the water needed for agriculture, industry, power and domestic purposes comes from snow that falls in the mountains during the winter. To determine how much water will be available in summer, snow surveyors measure water content of the mountain snowpack in the winter on over 1,400 snow courses and estimate the acre-feet runoff from individual mountain watersheds.

Snow and related hydrometeorologic data also are used directly for evaluating mountain sites as to their suitability for winter recreation areas, such as ski resorts, wildlife habitat, or for any other recreational or economic purpose where depth and duration of snowpack is an important factor. Snow accumulation data are also helpful in comparing proposed routes for new highways at higher altitudes. Managers of reservoir impoundments that supply water for domestic or power users in large





**SNOW SURVEYORS MEASURE** mountain snow pack as a basis for predicting runoff for irrigation, municipal flood control, power generation, and related uses. Advance knowledge of streamflow enables water managers to regulate reservoirs and make other necessary adjustments.

centers of population depend on water forecasts to plan their operations.

### **Land Inventory and Monitoring**

**Purpose:** To provide accurate resource and land use data to users and planners on 2.3 billion acres of land in the United States and Caribbean area for purposes of land conservation, resource development, community planning, and environmental improvement, and for developing land use policy and evaluating land use alternatives.

**Land Use Application:** Surveys and inventories land use activities and the kinds, amounts, and location of soil, water, and related resources; interprets basic resource data for prospective land uses, recognizing potentials and limitations. Monitors the changes and trends in land use, extent, and condition of resources to guide land use and development and land use policy; evaluates land use alternatives, and assists communities, States, regions, and the Nation in land use planning activities and development of appropriate land use policies at their level.



**PLANNED LAND USE**, showing pasture in foreground, farm pond to provide water for livestock and recreation, grass covered slopes, and woodland and farmstead in background.

### **Conservation Needs Inventory**

**Purpose:** On the 1.4 billion acres that comprise the Nation's *nonfederal* lands, to conduct and maintain a current inventory of land use categories and their requirements for soil and water conservation treatment.

**Land Use Application:** Makes available to communities, citizens, industrial and commercial concerns and planners, the county, State and national reports which provide accurate information on the acreage and conservation condition of cropland, pasture, range land, forest, and other lands. Included is an inventory of over 19,000 watersheds indicating those potentially feasible for development under the Watershed Protection and Flood Prevention Act (P.L. 566); a sophisticated, automatic data processing retrievable program also is available.

### **Aerial Photography**

**Purpose:** To provide photos and maps which illustrate existing patterns of land use. The photos assist in the accurate measurement of cropland acreage and indicate its uses; they implement the administration of compliance provisions of several USDA agricultural programs. Aerial photos are available for nearly every county in the United States and periodic reflights keep the records current.

**Land Use Application:** Aerial photographs indicate land uses at the time of flight. Comparison of current photos and maps against previous maps of the same area gives a graphic record of changes in land use. State and local governments can employ the photos and maps to establish administrative and other boundaries, construct reservoirs, improve watersheds, and install drainage structures and other public facilities. Aerial photos serve as “instant” base maps in appraising damages from natural disasters, such as earthquakes, floods, and major wild fires and in planning rehabilitation programs. Photos are also used by engineers for right-of-way determinations in building highways, pipelines, power lines, and other cross-country energy and traffic conduits involved in land use planning for community development.

## **Conservation Operations**

**Purpose:** To provide technical assistance to individuals and groups of individual land users in carrying out locally adapted soil and water conservation programs, based on soil surveys and land capability interpretations. This is done primarily within the legal boundaries of some 3,000 Conservation Districts organized under basic State laws in the 50 States, Puerto Rico, and the Virgin Islands.

**Land Use Application:** Provides for collecting, inventorying, evaluating, and interpreting soil, water, and related resource data on individual farms and ranches or groups of land units for use in long range planning; provides for consultation with planners on conservation activities relating to land use plans. The assistance given

MORE WILDLIFE HABITATS are needed in Nation's rural areas. This dugout and dam combination in native grassland was constructed on farm owned by cooperator in conservation district. Technical assistance was provided by Department of Agriculture. Construction was done by private contractor. Impoundment provides water for livestock and breeding ground for ducks.







**SOIL SURVEYOR MEASURES** deep but poorly drained sand in urban area. Soils of this type can create problems if extensive development plans are carried out. Advance knowledge will prevent costly mistakes.

to Conservation District cooperators is in the form of an individual conservation plan which may include a soil survey and land use capability map, a range-site map of rangeland, woodland suitability map, and specific agronomic, pasture management, and wildlife management recommendations. Conservation plans provide direction in implementing land use and treatment decisions. Technical assistance is provided to implement the recommendations in these plans. Conservation districts have broad authority to include property outside their boundaries and to include towns and cities within their boundaries.

### **Forest Survey**

**Purpose:** To plan, organize, and provide technical direction of periodic timber surveys, including a comprehensive nationwide inventory made each decade to determine the acreage, location and condition of the country's forest lands. Quantity, quality, species composition, ownership, and availability of commercial timber on these forest lands are given in the published report. Current and probable future rates of timber growth, mortality due to insects and disease, and harvesting drain on the forests are estimated, together with a long range forecast of demand and supplies. This major report is supplemented with special regional and commission reports and an annual report on demand and supply for timber products.



**MULTIPLE USE IN FOREST** area is emphasized in this National Forest scene. Harvested timber leaves area, bound for wood processing plant. On the way in is recreation-seeking visitor at right. Under land use planning forested slopes are managed to furnish continuing supplies of water, wood, wildlife, forage and recreation.

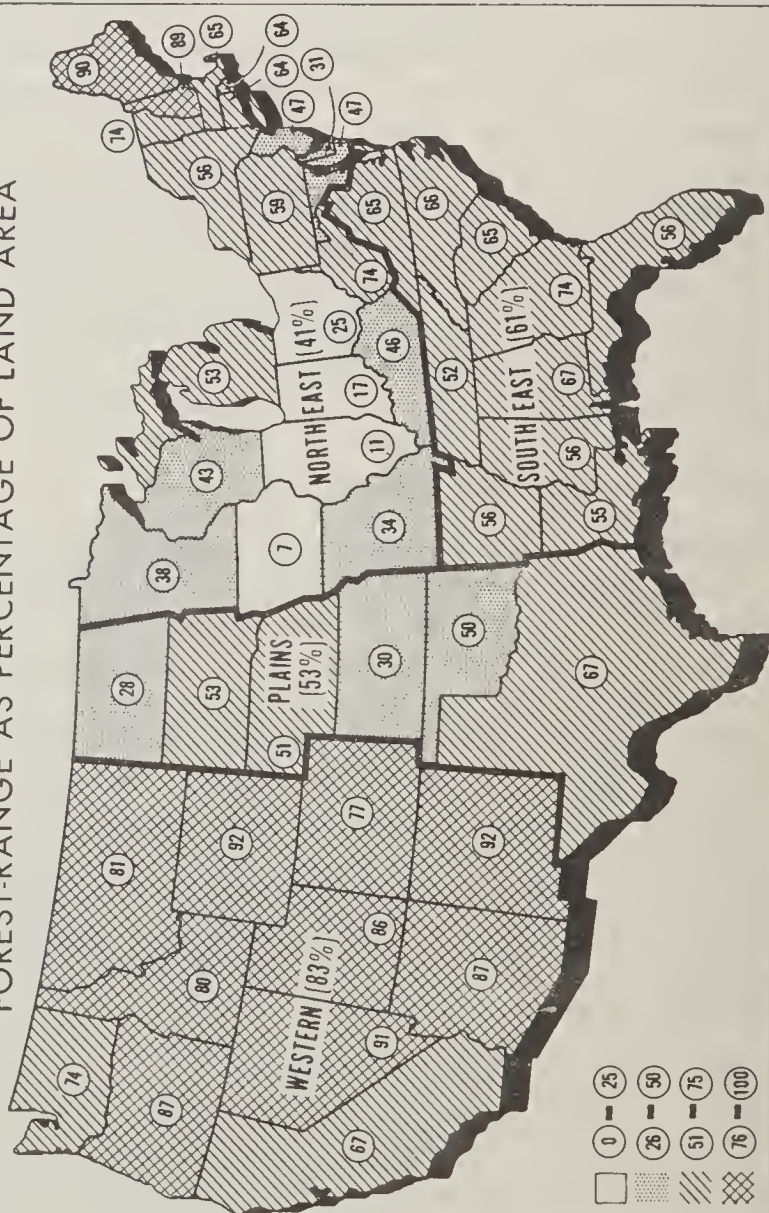
**Land Use Application:** Provides accurate inventory data needed for more effective utilization of the Nation's timber resource; this allows for improvements in local and regional land use patterns, rehabilitation of poorly stocked and fire ravaged lands, selection of possible sites for wood utilization plants, more orderly planning for the sustained yield output of timber crops, and general multiple use benefits. Evaluations of economic trends also help determine allocations of lands to be retained in permanent forest cover.

### **Forest Range Resource Inventory**

**Purpose:** A special task force has recently completed and published a forest-range environmental study of the Nation's 1.2 billion acres of forest range. It classifies the forest-range type into 34 major ecosystems, comprising 63 percent of the land base in the 48 conterminous States. Current production of animal unit months of grazing and of 21 associated resource outputs was estimated for each of 956 resource units. Using assembled information and an analytical system, many alternatives were constructed and evaluated for producing grazing at minimum cost for different target levels under selected political, social, environmental, and economic constraints.

**Land Use Application:** The special study, supplemented with individual range surveys made under established USDA programs, provides a guide for allocation of acceptable land uses and a further basis for evaluating alternative uses and treatments. The study shows that

## FOREST-RANGE AS PERCENTAGE OF LAND AREA



FOREST SERVICE, USDA, maintains jurisdiction over 14 percent of the forest-range land shown (166 million acres) on map. Other Federal land ownership totals 207 million acres (17 percent); non-Federal lands total 829 million acres (69 percent).

The eleven Western States dominate in total area, with 622 million acres of forest-range. The Great Plains has 214 million acres; Southeast, 184 million; Northeast, 182 million. The forest range area is twice the combined acreage of cropland, urban areas, rural highways, railroads, airports, farmsteads, and farm roads and lanes, and twelve times as much as all improved private pasture.

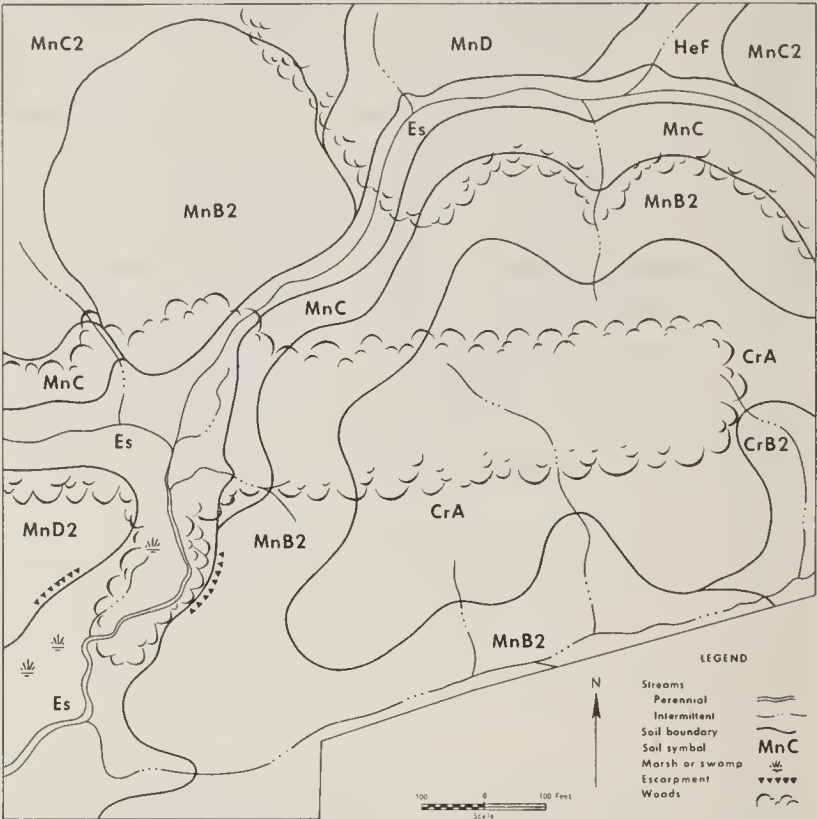


some forest-range may be overdeveloped or improperly grazed. Applying the 18 range management practices commonly recognized, the study indicates that investment costs vary greatly; they are estimated under six simulated levels of management. By applying national goals for livestock production, output can be determined for various conditions as modified by environmental or social considerations. The study suggests that additional grazing potential exists in some areas. Since most of the Nation's forest-range environment is not federally owned, major grazing impacts on environmental quality will depend on management standards used by private owners. Land use planners thus can help determine alternatives for decision making.

**CLASS 1 FARM LAND** is suited to production of high yield agricultural crops, like corn, with little risk of erosion. This fine sandy loam soil was treated with manure and then irrigated.



Soil map



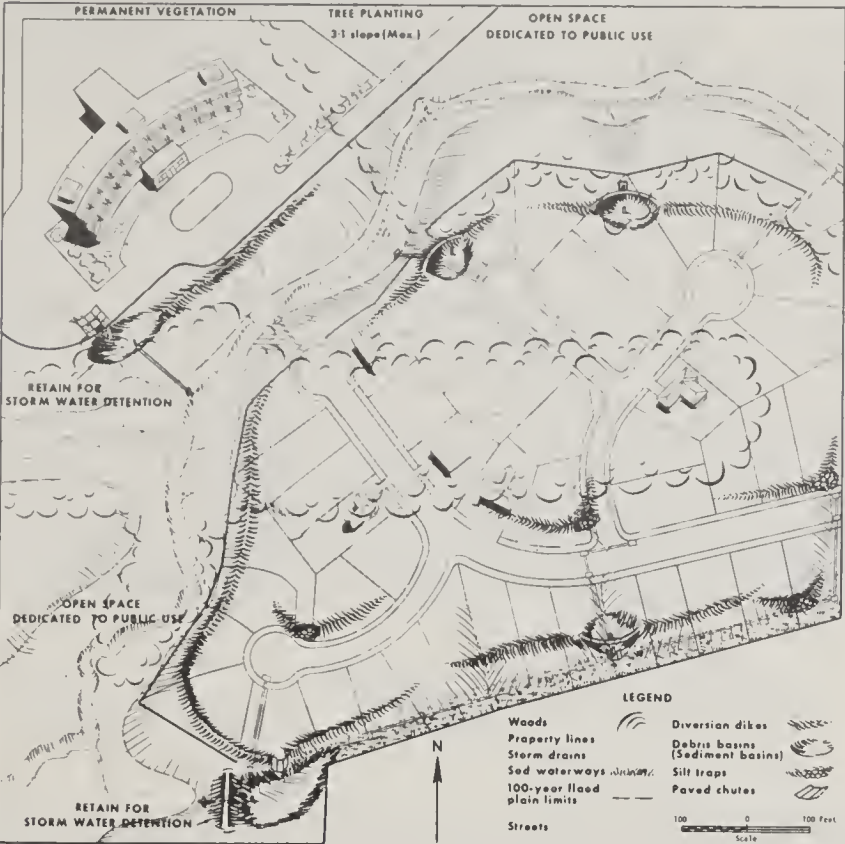
**SOIL LIMITATION CLASSES**—Soils rated as **SLIGHT** have few or no limitations for the designated use. Soils rated as **MODERATE** have limitations that reduce to some degree their desirability for purpose being considered. They require some corrective measures. Soils rated as **SEVERE** have unfavorable soil properties or features that severely restrict their use and desirability for purpose. Severe rating does not mean that soil cannot be used for specific purpose, because many problems can be corrected.

Some 2200 soil surveys have been published in the United States, mostly on a county basis; 1,200 of these are in print. The remaining 1,000 can be consulted in various reference files, in county USDA offices, or elsewhere.

Soil interpretations

| Symbol       | Soil     | Erosion hazard                  |
|--------------|----------|---------------------------------|
| CrA          | Crosby   | Slight                          |
| CrB2         | Crosby   | Moderate; sheet erosion         |
| Es           | Eel      | Moderate; streambank erosion    |
| HeF          | Hennepin | Severe; sheet and gully erosion |
| MnB2         | Miami    | Moderate; sheet erosion         |
| MnC,<br>MnC2 | Miami    | Severe; sheet and gully erosion |
| MnD,<br>MnD2 | Miami    | Severe; sheet and gully erosion |

Planned land use and conservation treatment



THE PLAN—Example of developer’s conservation plan for housing development that provides for attractive environment based on careful use of soil, water, and plant resources. Plan is based on interpretations of soils in area, as indicated in preceding section. Pictorial map shows developer’s plan. More often, however, a plat map that shows topography, lot measurements, street widths, and other features is used.

Detailed designs of conservation measures, although not shown in this example, are necessary part of conservation plans. Designs must comply with standards and specifications adopted by governmental entity that has responsibility for review and approval.

Conservation plans for developing areas that have different climate, soils, and topography require different land use and conservation measures. For example, in some areas high water table is as great a problem as erosion and sedimentation.

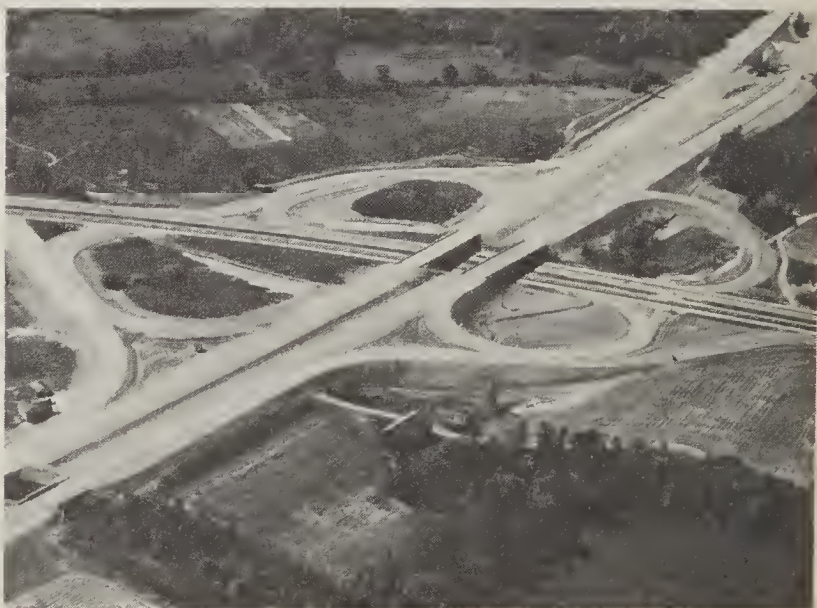
| Dwellings—three stories or less |                   | Septic tank absorption fields | Location of roads and streets | Parks or nature trails |
|---------------------------------|-------------------|-------------------------------|-------------------------------|------------------------|
| With basement                   | Without basement  |                               |                               |                        |
| Severe; wetness                 | Moderate; wetness | Severe; wetness               | Moderate; wetness             | Moderate; wetness      |
| Severe; wetness                 | Moderate; wetness | Severe; wetness               | Moderate; wetness             | Moderate; wetness      |
| Severe; floods                  | Severe; floods    | Severe; floods                | Severe; floods                | Moderate; floods       |
| Severe; slope                   | Severe; slope     | Severe; slope                 | Severe; slope                 | Severe; slope          |
| Slight                          | Slight            | Slight                        | Slight                        | Slight                 |
| Moderate; slope                 | Moderate; slope   | Moderate; slope               | Moderate; slope               | Moderate; slope        |
| Severe; slope                   | Severe; slope     | Severe; slope                 | Severe; slope                 | Severe; slope          |





PLEASING PATTERN of rural countryside is being marred by intrusion of row house development in foreground. Road building and site clearing cause erosion. Whether subsequent developments will blight or enhance rural area depends on how effectively land use planning is used.

MODERN FREEWAYS DEVASTATE natural beauty in countryside because of land areas required to construct access roads and ramps at major interchanges. Here is opportunity to temper degradation of environment by seeding or planting cut and fill sites and otherwise stabilizing disturbed areas. Land use planners must consider long range highway plans for all lands because of their construction impacts in residential and rural areas.



## Section II

### Programs that affect

### Land Uses

MANY DEPARTMENTAL PROGRAMS serving farmers and ranchers now are available to residents of urban areas. In this attractive subdivision, application of good engineering and agronomic measures has stabilized a critical soil area and also beautified the site. Retention of native tree cover adds to natural beauty of area. Urban forestry assistance also is available.





## Programs May Influence Decisions

The responsibility for making a land use decision rests primarily with individual landowners and local units of government. Should the land be used for crops, pastures, housing, industry, or recreation? Or should it be set aside for a trailer park or wildlife area? What effect will the decision have on the property of neighbors and the community as a whole? Where do we locate the highways, airports, water impoundments, open spaces, parks, factories and houses that are involved in community planning?

To answer these questions, decisionmakers must work with other residents and groups in their community—they cannot make a decision in a vacuum. In addition to having available the inventory data previously described, community leaders must be aware of the social and economic changes that impose demands on local lands, both now and in the future. They must know how to interpret facts for a better understanding of their environment, so that their community will be one in which people can live without serious disruptions.

The United States Department of Agriculture, responsive to group actions, operates many supporting programs and offers technical services which either affect land uses or make certain options feasible. Familiarity with these varied programs may suggest alternative approaches for group action, because sound conservation practices are fundamental in establishing permanent land use patterns.

This section summarizes the USDA programs and services which should be studied and considered before final individual or group decisions are made on land uses.





**MULTIPLE PURPOSE FLOOD PREVENTION** water impoundments, made possible under PL-566 program, provide many benefits to down-stream communities and farmlands. In many instances such a reservoir also serves as source of domestic water supply. It may also provide water-oriented recreation sites.

## **WATERSHEDS AND RIVERS**

### **River Basin Studies**

**Purpose:** River Basin studies carried on cooperatively with States and other federal agencies are conducted to analyze the problems, needs, and opportunities for water and related land resources and thereby provide a guide for the conservation, development and utilization of these resources in an efficient and timely manner. Such planning provides the basis for well-considered decisions among alternative uses of the resources.

**Land Use Application:** River Basin studies analyze and project the agricultural, forestry and related economics of river basins, including the use of land and water. Land use is determined for the present and projected up to 50 years in the future for such use categories as cropland, pasture, forest, urban, and other categories. Specialized areas such as floodplains and wetlands are also identified. Consequently, such studies indicate certain lands which have special problems or environmental values. They also reveal the present and long range needs for lands for urban, forestry, agricultural, transportation and other purposes. The studies can be used to evaluate the alternative land use possibilities for meeting present and future needs.



SUBDIVISION LOCATED in flood plain area was immersed during heavy rainfall, with heavy property damage. Soil surveys indicate such flooding hazards.

## **Watershed Protection and Flood Prevention**

**Purpose:** To provide technical and financial assistance to sponsoring local organizations for planning and installing flood prevention projects on watersheds not exceeding 250,000 acres in size; to conserve, develop, utilize, and dispose of water, in an orderly manner; and to conserve and properly utilize land.

**Land Use Application:** Permits more effective utilization of land resources within their full land use capabilities, by reducing, eliminating, or controlling destructive influences.

### **Flood Prevention**

**Purpose:** To provide technical and financial assistance to sponsoring local organizations for planning and installing projects on sub-watersheds within the 11 watersheds authorized for flood prevention; to plan for the conservation, development, utilization, and proper disposal of water and the conservation and proper utilization of land.

**Land Use Application:** Permits more effective utilization of land resources within their capabilities, by reducing, eliminating, or controlling destructive influences.

### **Flood Hazard Analyses**

**Purpose:** In cooperation with State and local governments the Department carries out flood hazard analyses in order to identify flood hazard areas and to provide other information needed by local governments to provide for management of flood plains. Technical

studies, primarily hydraulic and hydrologic, are concerned with the flood history of recognized flood plains, so that management guidelines can be suggested for future land use programs. Reports for flood plain areas include elevation profiles, maps, and chronological and meteorological data.

**Land Use Application:** Information provided in Flood Hazard Analyses is used directly by local land use agencies to define areas subject to flooding, to develop encroachment lines, to control new construction in flood plains, to define floodways, and to develop land use and management regulations for flood plain lands.

### **Emergency Watershed Protection**

**Purpose:** To install physical and vegetative measures for retardation of runoff and soil erosion, as may be needed to safeguard life and property whenever a watershed is impaired by fire, windstorm, floods, or any other natural catastrophe.

**Land Use Application:** Provides temporary protection to impaired watersheds to guard them against additional damage from floodwaters, erosion, and sediment until more permanent protection can be installed.

### **Waste Disposal**

**Purpose:** To provide workable field guides for rating the limitations of identified soil types on lands proposed for use as waste disposal sites; and to develop management systems for disposing of agricultural wastes.

**Land Use Application:** Assures proper selection of soils suited for waste disposal sites to avoid pollution of streams and ground water and to avoid excessive buildup of heavy metals or other toxic substances in the soils; achieves waste disposal objectives; aids the planning and design of waste management system components for treatment, utilization, or disposal of wastes, recognizing soil, climate, crop, and operational limitations.

**FLOODED BUILDING SITE** indicates sandy soil, with high water table and low capability for septic tank drainage.







**SEDIMENT AND EROSION** damage occurred after 6-inch rainfall in one week. Temporary erosion control measures were not used by builder while houses were being constructed.

### **Wild and Scenic Rivers System**

(In cooperation with Department of the Interior)

**Purpose:** To preserve in a free flowing condition those rivers which possess remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural or similar values, so that present and future generations can enjoy the benefits.

**Land Use Application:** Designation of a river as a scenic or wild river prevents use of the river for commercial or non-compatible purposes. The designation also emphasizes the recreation and scenic qualities of the adjacent lands. This emphasis may stimulate changes in land use and result in restrictions on nonconforming uses. Intensity of other developments is usually controlled.

### **Municipal Watershed Program**

**Purpose:** To provide technical assistance to achieve multiple use management on millions of acres situated in municipal watersheds.

**Land Use Application:** Establishes cooperation with municipalities to furnish land use planning assistance and leadership. Management of municipal watersheds is becoming more important as cities encounter water shortage problems and face increasing maintenance costs.

## **CONSERVATION AND ENVIRONMENTAL IMPROVEMENT OF FARM AND FOREST LANDS**

### **Appalachian Land Stabilization and Conservation**

**Purpose:** To help attain economic goals in designated areas in the 13 Appalachian States by carrying out land stabilizing and conserving practices.

**Land Use Application:** Stimulates landholders (by cost-sharing and technical aid) to use land and water resources in such a way as to stabilize and conserve land in parts of 13 States (program is not now available except for carrying out contracts extending to June 30, 1982).

### **Emergency Conservation Measures**

**Purpose:** To control wind erosion or to rehabilitate farmlands damaged by natural disasters.

**Land Use Application:** Helps landowners (by cost-sharing and technical aid) to carry out emergency conservation measures to control wind erosion or to rehabilitate their lands by reestablishing conservation practices.

### **Water Bank Program**

**Purpose:** To get owners of private lands, primarily in the Prairie Potholes Area of North and South Dakota and Nebraska, to protect their wetlands from drainage or other attrition, to enhance migratory waterfowl habitat, and to provide other benefits.

**Land Use Application:** Stimulates (by cost-sharing and technical aid) landholders in selected important migratory waterfowl nesting and breeding areas to preserve specified wetlands from drainage, filling, burning, etc., to protect waterfowl, and to help meet other environmental and economic goals. Contract agreements in 1972 covered over 90,000 acres in 56 counties in 13 States.

### **Rural Environmental Conservation Program (RECP)**

**Purpose:** To encourage agricultural producers to install conservation and environmental improvement practices

POOR RANGELAND area was successfully reseeded with better grasses, after one treatment with specially developed brush control and seeding equipment.



on their lands for the benefit of their lands and waters, the community, and the general public.

**Land Use Application:** Stimulates (by cost-sharing and technical aid) agricultural producers to use land and water resources and install treatment practices in such a way as to conserve soil, water, woodland, and wildlife and to prevent or abate agriculture-related pollution of water, air, or land.

### **Resource Conservation and Development (RC&D)**

**Purpose:** To expand the economic opportunity for people in a given area by assisting them in developing and carrying out action plans for conservation, improvement, development, and wise use of natural resources by providing technical, financial, and loan assistance to local sponsors throughout the Nation.

**Land Use Application:** This national program, operative in all States, directly involves land use plans since the plan of action is coordinated with any State and local government plans. Inventories and evaluations can be provided through the Resource Conservation and Development Program to assist in land use planning. Cost sharing and loans can be used to help implement certain features of land use plans dealing with water-based recreation and wildlife, conservation, sediment control, and other authorized improvements.

### **Great Plains Conservation Program**

**Purpose:** To assist farmers and ranchers within designated counties of the Great Plains region in making land use adjustments through cost-sharing and technical assistance provided under long-term contracts; and to install measures needed to conserve, develop, protect and utilize their soil and water resources. (The Great Plains region includes portions of Montana, Wyoming, Colorado, New Mexico, Oklahoma, Kansas, Nebraska, North and South Dakota and Texas).

**Land Use Application:** Achieves proper land use; controls wind and water erosion; develops fish, wildlife, and recreation resources; reduces or controls agriculture related pollution, and promotes economic uses of land. Contracts are entered into with producers to improve the quality of land use.

### **Improved Plant Materials**

**Purpose:** To develop in nurseries and provide subsequent technical information on the characteristics and growth habits of improved varieties of grasses, legumes, shrubs, trees, and forbs which have value for special





SPECIAL SINGLE-PASS brush control and seeding equipment was developed through research carried on by Department. Helicopter is photographing project. Range rehabilitation is land use planning investment that should be considered.

plantings that will control erosion and assist in establishing conservation measures.

**Land Use Application:** Appropriate plant materials established on the land help reduce sediment loads running to streams from many types of critical areas. Adapted conservation plant materials increase pasture and range production, improve wildlife habitat, and help control wind, drifting sand, and snow. The use of tested and recommended plant materials will help stabilize eroding lands with greater success at a more reasonable cost.

### **Wind Erosion Condition Reports**

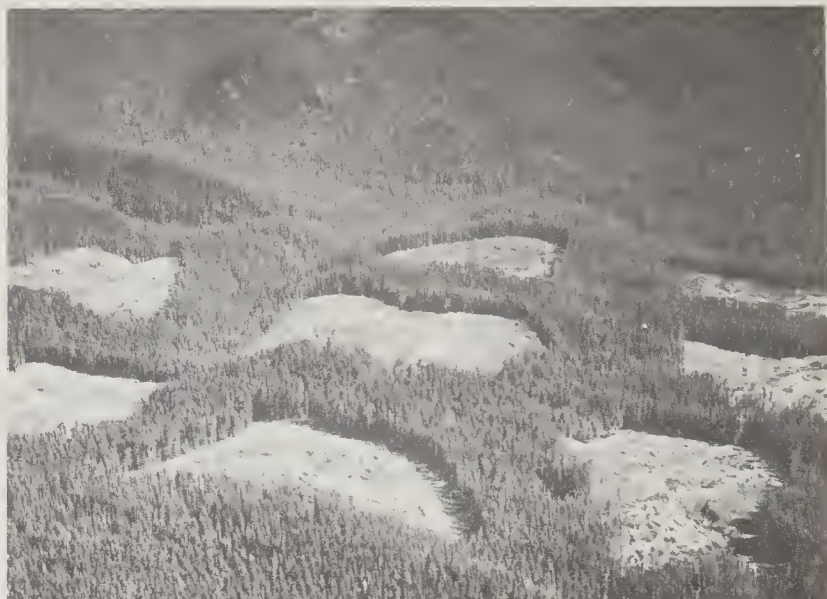
**Purpose:** To report on wind erosion conditions in 250 counties in 10 Great Plain States. Conditions reported regularly by Department field offices include wind erosion prevalent or expected and the approximate acreage of land damaged.

**Land Use Application:** Summaries are an aid to land users and planners in the Great Plains region because they present the pattern of wind erosion threats in a region of harsh climatic variation.

## **FOREST, WILDLIFE AND RECREATION PROGRAMS**

### **Soil-Woodland Site Interpretation and Evaluation**

**Purpose:** To provide a practical correlation between soil types, timber growth capacity expressed as a woodland site index, soil-related hazards and use limitations, cost effectiveness of certain woodland management practices, and the environmental impact of woodland conservation measures.



**TIMBER HARVESTING PATTERN** in forest areas of old growth timber. Landscaping treatment creates irregular boundaries for clear cut blocks instead of visually offensive straight lines.

**Land Use Application:** Provides valuable information needed for making decisions related to future land uses. These data are vital in considering alternatives to managing an area as woodland, cost effectiveness of various measures, and the resulting environmental impacts.

### **Forestry Incentives**

**Purpose:** To motivate non-industrial private landowners of woodland areas, through the use of incentive payments, to reforest and practice multiple-purpose management and to protect forest resources so as to provide for production of timber crops and related multiple use benefits.

**Land Use Application:** Use of cash incentives for establishment of specified woodland management conservation practices results in more responsible stewardship on non-industrial ownerships, plus an increased flow of timber products and public benefits through establishment and culture of timber stands. The program encourages greater use of private land for forest production purposes. This program should help stabilize ownership of forest lands.

### **Tree Planting and Reforestation**

**Purpose:** To assist States in undertaking needed programs of tree planting and other forestation work to help assure an adequate future supply of timber for industrial purposes.

**Land Use Application:** Improves multiple use benefits from forest lands that are not adequately stocked with tree growth.

## **Cooperative Wild Fire Control**

**Purpose:** To initiate and carry out statewide plans to protect the forest resources within a State from wildfire.

**Land Use Application:** Cooperative agreements specifying protection measures and respective responsibilities usually are entered into with State foresters. The program reduces direct losses of forest products and protects watersheds, grazing areas, wildlife habitats and recreation areas on State and private forest lands.

## **Cooperative Forest Management**

**Purpose:** To improve and maintain the productivity of privately-owned forest lands, by providing technical management and marketing assistance to landowners and wood processors, directly or cooperatively through State foresters.

**Land Use Application:** Assures that landowners who wish to maintain woodland areas for timber production and multiple use benefits can obtain needed conservation assistance. Helps provide environmental protection and improves forest lands.

## **Forest Pest Control**

**Purpose:** Through cooperative federally sponsored programs, to reduce to tolerable levels timber losses caused by forest insects and diseases on State and private forest lands.

**Land Use Application:** Salvage harvests and direct control measures, applied with environmental considerations, will protect watersheds, improve wildlife habitat, benefit recreation, and protect timber and grazing resources. Such treatment is particularly desirable when epidemic attacks occur.

## **Urban and Community Forestry**

**Purpose:** To preserve, protect and improve the park and woodland areas, individual trees, and associated woody plants growing in urban and rural communities, in order to create a more attractive and healthful environment in which people can live, work, and play.

**Land Use Application:** Assists in planning and carrying out conservation practices which affect land uses in open space, greenbelts, and in established community parks and forests occurring in residential, commercial, and industrial zones. Provides technical advice to residential property owners with problems relating to individual trees.





**TRANSITION FROM OPEN AREA** to metropolitan development. From this charming remnant of wooded countryside one can see heavily industrialized hodgepodge in middle distance and stark towers of city's high-rise buildings, in distance. Retention of open space areas is recommended in land use allocations.

## **MULTIPLE USE PROGRAMS ON THE NATIONAL FOREST SYSTEM**

### **Timber Management**

**Purpose:** To provide a sustained yield flow of timber from the commercial forest areas of the National Forest System, for economic and social purposes, consistent with maintenance of environmental and quality harvesting standards.

**Land Use Application:** Through planned and orderly timber harvests designed to meet national production goals and comply with allowable annual cut restraints, vegetative forest cover will be managed by manipulation of species composition, harvesting patterns, and site factors. Genetic characteristics of trees will be improved. The composition, density, and distribution of timber on forest lands will be controlled. Denuded forest lands are restocked. The natural beauty of outdoor areas will be enhanced as orderly harvests are carried on under approved standards meeting landscaping and other requirements.

### **Soil and Water Management**

**Purpose:** To maintain and improve a continuous flow of high quality water and to conserve the soil.

**Land Use Application:** Program monitors forest activities that might effect the quality and quantity of water



flow or damage the soil resource. Conserves soil and water supplies through development of constraints on incompatible human activities.

## **Wildlife Management**

**Purpose:** To maintain and improve the habitat for all species of furred, feathered and finned wildlife on National Forest lands. Some of these lands may be near rural communities or major outdoor recreation developments, such as ski areas.

**Land Use Application:** Manipulates vegetative cover and installs or improves facilities which provide food, water, cover or nesting sites protecting and favoring the growth of wildlife populations. Maintains special habitat requirements for rare and endangered species.

## **Range Management**

**Purpose:** To provide forage to meet increasing demands of domestic livestock and also big game populations.

**Land Use Application:** Revegetates or modifies inferior range land types, replaces low value brush areas with forage type grasses and plants, constructs physical improvements for better distribution of water and livestock, controls undesirable range plants, improves mechanical equipment for reseeding range lands in need of rehabilitation, and enhances the environment. Works with individual ranchers or groups of ranchers in adjusting livestock numbers to carrying capacities of ranch pastures and related outside grazing lands, thus preventing damage to soil resources.

NATIVE GRASS on mixed prairie site. Loamy prairie site is in background. Land has low risk on erosion.





RECREATION CAN BE FUN or nightmare. Anglers have jockeyed for position in popular stream obviously overfished. Good land use planning can help disperse recreationists to prevent overuse of natural resources.

## Fire Management

**Purpose:** To recognize that natural fire can be a part of some ecosystems, as in wilderness, and managed compatibly with land management objectives. To prevent and control man-caused and naturally caused wildfires in rural areas where timber, property, and soil and water resources would be damaged.

**Land Use Application:** In those urban areas where people build homes in wildland surroundings, fire management provides valuable help. Special cooperative fire prevention programs include education, land use planning, zoning, and use of building codes to curb increasing fire hazard. Program permits fire management authorities to use prescribed fires, burning under specified and controlled conditions, to attain certain land use objectives, such as improving the habitat for wildlife species, stimulating reseeding of forest species, or reducing fire hazards due to fuel accumulations.

## Recreation Management

**Purpose:** To provide a wide variety of recreational opportunities for forest visitors.

**Land Use Application:** Integrates recreational opportunities, including swimming, boating, picnicking, and camping, with other forest uses. Provides accessible sites and facilities for the enjoyment of both urban and rural residents. Provides interpretative natural facilities for all people, including handicapped. Gives youth groups outdoor classrooms for studying nature. Develops a

land-use pattern that minimizes overuse of certain forest areas.

## **Wilderness Management**

**Purpose:** To dedicate a portion of the acreage in the National Forest System to the use, enjoyment, and preservation of wilderness, as provided for in the National Wilderness Preservation System, authorized by the Act of 1964.

**Land Use Application:** Provides managed areas throughout the United States where recreationists can seek and enjoy the comparative solitude of wilderness. A designated area of over 10 million acres of wilderness in the National Forest System assures that our Nation will have protected areas dedicated to the enjoyment of a wilderness environment, thereby removing possible recreational impacts on other lands.

## **Land Classification and Adjustment**

**Purpose:** To provide the Forest Service with a basis for assuring land ownership patterns and land uses of maximum benefit to national land use objectives in rural areas. Designation of specific uses is partly related to the demands for particular goods and services required by communities located within a National Forest environment.

**Land Use Application:** Permits operation of land exchange or land purchase programs which will help block out logical management units that will comply with local zoning designations made to meet land use objectives. Considers community, environmental and other aspects in making land exchanges with private owners or purchasing privately owned lands.

## **AGRICULTURAL PRODUCTION PROGRAMS**

### **Sugar Program**

**Purpose:** To limit sugar producing acreage in the United States to that needed to meet international quotas.

**Land Use Application:** Establishes proportionate acreage allotments (when needed) by apportioning sugar producing acreage among producers within a predetermined national total, leaving other farmland for other uses.

### **Acreage Allotment and Marketing Quota Programs**

**Purpose:** To help keep agricultural production within the United States in balance with domestic and international demands and to provide fair economic returns to program participants.

**Land Use Application:** Establishes acreage allotments by counties for certain basic crops and (if approved by ballot among producers) marketing quotas to help meet overall USDA production goals, thereby adjusting land uses between these basic crops.

### **Wheat, Feed Grain, and Cotton Set-Aside Programs**

**Purpose:** To help keep wheat, feed grain, and cotton production in balance with domestic and international demands and provide fair economic returns to wheat, feed grain, and cotton producers.

**Land Use Application:** Establishes acreage set-asides from wheat, feed grain, and cotton production to help maintain the level needed for domestic and export markets. The set-aside acreage is to be devoted to approved conservation uses and may in addition have agreements providing for free public access for hunting, trapping, fishing, and hiking.

## **FINANCING PROGRAMS RELATED TO LAND USE**

### **Farmer Loans**

**Land Use Application:** Basic land use planning is involved in all farmer loan programs. The individual farm plan accompanying a loan provides for the orderly use of land to help the farmer achieve his objectives and at the same time improve and conserve the soil, water, and related natural resources while helping to prevent erosion and sedimentation of streams and lakes. Comprehensive land use planning in a community can have considerable influence on the future use of farmland in an area. USDA loan services can be more effective if they consider proposed or possible changes in land use suggested by community action. The purposes of the several kinds of USDA farmer loans are described below. The various land use applications described here apply to all loans listed.

#### *Farm Ownership Loans*

**Purpose:** To buy land; refinance debts; construct, repair or improve buildings; improve farmlands; develop water facilities and establish farm-based business enterprises to supplement farming income.

#### *Operating Loans*

**Purpose:** To buy livestock, equipment, feed, seed, fertilizer or supplies for farm operations; refinance debts





**WATER WORKS SYSTEM** installed on utility district received financial and technical assistance from Department, under Community Services program. Storage tank is part of system.

or pay interest on them; pay depreciation on equipment; make minor real estate improvements; improve forest lands; and establish non-farm enterprises to supplement farm income.

### *Soil and Water Conservation Loans*

**Purpose:** To finance land and water development measures, forestation, drainage of farmland, irrigation, pasture improvement, and related land and water use adjustments.

### *Recreational Loans*

**Purpose:** To develop recreation areas including swimming, boating, and camping facilities.

### *Grazing Association Loans*

**Purpose:** To acquire and develop grazing land for livestock of association members.

### *Indian Land Acquisition Loans*

**Purpose:** To assist Indian tribes in acquiring land within their reservations for improved land management and development.

### *Irrigation and Drainage Loans*

**Purpose:** To develop community irrigation, drainage, and other soil and water conservation and use facilities.

### *Farm Emergency Loans*

**Purpose:** To provide operating or living expenses and replace livestock and equipment needed to restore normal operations after severe loss from natural disaster.

Repairs to homes, essential farm buildings, and related facilities are included.

## **Rural Housing Loans**

**Land Use Application:** Because of the large acreage of land used in programs for rural housing, business and industrial uses, and community services, as described in the following four types of rural housing loans, and because of the influence community services programs have on use of land surrounding their projects, it is essential to plan for location of projects in a manner to preserve good agricultural land and meet aesthetic and ecological standards. For these types of loans, the public organizations or agencies involved in comprehensive planning designate locations for new housing developments. Loans to builders and developers to finance housing and homesite development conform to an overall land use plan, which considers soil types and related factors. Such action is essential for orderly growth in developing rural areas. Proper and balanced land use is considered when planning the subdivision, so that provision is made for green space and other amenities. Erosion control measures are established to prevent erosion during development of the subdivision, including site preparation, road construction, drainage installations, and subsequent home construction.

### *Individual Home Ownership Loans*

**Purpose:** To buy, build, improve, or relocate home or farm service buildings; to buy building sites; to refinance certain debts.

COMMUNITY SERVICE PROGRAMS of Department offer communities financial and technical assistance in layout of service facilities, such as roads, etc.



## *Rental and Cooperative Housing Loans*

**Purpose:** To build, buy, improve or repair rental or cooperatively owned houses or apartments for independent living by senior citizens and low to moderate income families.

## *Homesite Development Loans*

**Purpose:** To buy and develop building sites for sale to low- and moderate-income families.

## *Conditional Commitments to Builders*

**Purpose:** To encourage quantity building in *rural areas* and to provide an orderly supply of quality housing in these areas.

## **Community Services Loans**

**Land Use Application:** For the two community services loans described in the following text for water and waste disposal loans and other essential community facility loans, land use planning helps develop rural communities properly and determines the need for and location of basic facilities, such as water and sewage systems.

## *Central Water and Waste Disposal Loans*

**Purpose:** To make available loans to construct community water, sanitary sewer, and solid waste disposal systems for communities and towns of up to 10,000 population.

## *Other Essential Community Facility Loans*

**Purpose:** To provide public agencies with fire halls and related equipment, multiple type community centers, ambulance services, industrial parks, etc., in communities and towns of up to 10,000 population.

## **Watershed Loans**

**Purpose:** To loan an applicant funds to finance his share of projects needed to protect and develop land and water resources in small watersheds. Examples: flood control dams, reservoirs, irrigation canals, and easements.

**Land Use Application:** Influences land use in and around watershed projects provided by P.L. 566, which makes the surrounding land adaptable to more uses. Each project funded is subject to local land use plans.

## **Resource Conservation and Development Loans**

**Purpose:** To conserve and develop natural resources. Loans must be for community benefit and contribute to the economic improvement of the area.



**Land Use Application:** Projects funded under this program have a direct influence on other land use; some affect large acreages outside the immediate project site. Each project is subject to local land use plans.

## **BUSINESS AND INDUSTRIAL LOANS; GRANTS TO PUBLIC BODIES TO FACILITATE PRIVATE BUSINESS AND INDUSTRIAL DEVELOPMENT**

**Purpose:** To provide for improving, developing, or financing business, industry and employment opportunities and improving the economic and environmental climate in rural communities, including projects for pollution abatement and control.

The grant program assists local governments in providing essential facilities needed for business and industry to locate in their communities. Such items would include development, construction or acquisition of land, buildings, access streets and roads, parking areas, utility extensions, and water systems and waste disposal facilities.

**Land Use Application:** Because business and industry consume large parcels of land and sometimes influence the use of land in the immediate surrounding area, land use planning provided for these loans is most important in placing industry properly within a community. The growing significance of industrial parks and the gradual expansion of suburban development into basically rural areas demand the utmost care in allocating compatible land uses, to avoid serious conflicts between uses. Involved are erosion, disturbance of ecological condition, loss of proper values, and disruption of social patterns.

**SUBDIVISION ENCROACHES** on agricultural land, foreground. Entire area shown formerly produced artichokes, has been engulfed by residential development occurring on good soil. Area shows little evidence of open space or greenbelt considerations.





## Section III

Programs that support

# Land Use Research and Education

RESEARCH IN LAND USE considers improved varieties of grasses, shrubs and trees. Grass-legume combination shown is being tested for improvement in yields and seed quality.



## Research and Education Help Land Use Planners

Land is a basic national asset. It must be used wisely and managed carefully to enhance and protect its productivity and quality for all Americans—present and future.

Land use is a national problem. It cuts across traditional boundaries. Mistakes in land use take generations to correct. We seldom get a second chance. We must address the broad, long-range problem of land use—how to better combine our technical resources and the political process into an effective planning and decisionmaking mechanism.

At the community level, too much land use planning has been hit-or-miss, project-by-project, in response to an emergency or a crisis. Such a piecemeal approach has left many peoples' needs unfulfilled. Community leaders are realizing more than ever the need to discuss community land use problems and opportunities, gather facts, set goals and priorities and put this all into a written plan of action—a dynamic land use plan. This is comprehensive, coordinated planning and development. The citizens are the planners—using technical consultants and the public affairs educational framework where appropriate. Land use planning is effective if such group action is employed, so that individuals can share ideas and proposals.

The Department's highly developed and effective research and delivery system reaches into every State and county of the Nation and its multiple services are available to assist in the land use planning effort at all levels.

Research and education not only anticipate change but stimulate it. USDA probers, teachers, counselors, and information specialists are constantly on the alert for improved land use planning techniques and better ways to disseminate new information.

The primary thrust of the Department will be to provide timely decisionmaking information and planning assistance to the people, agencies and groups involved in land use planning in States and localities.



CONSERVATION EDUCATION carried on with youth groups is essential in establishing early orientation toward soil and water stewardship. Interest stimulated in this outdoor setting with land use panorama is likely to last into adult years. Basics of land use planning can be introduced.

The following section describes some current USDA research and educational efforts which can benefit land use planning and help communities become better places in which to live and work.

## EDUCATIONAL PROJECTS

### Land Use Policy Education

**Purpose:** To explain the differences between land use *policy* and land use *planning* and between *planning* and *zoning* and the effects of each on property rights and values. To explore the legal issues of *public* vs. *private* rights and the impact of national land use policy.

To consider the impact of tax policies on land use decisions and vice versa. To assemble and disseminate these issues in public affairs type programs which consider alternatives.

**Land Use Application:** Provides better decisionmaking base for State and local planners, community leaders, legislators and other policy makers as they strive to bring about land use policies and regulations that will help to preserve our scarce land resources and enhance the quality of life in America.

### Outdoor Classrooms for Environmental Studies

**Purpose:** To provide opportunities for children and adults to understand principles of land and resource management that are important in efforts to improve the quality of the environment.

**Land Use Application:** Demonstrates principles of good land use and management on locally-owned public land.

Involvement of the community in design and development of outdoor classrooms gives citizens firsthand experiences with resources and their management. These experiences are applicable in making land use choices and resource management decisions necessary for effecting environmental improvements in the community.

### **Coastal Zone Planning Education**

**Purpose:** To explore the various alternative coastal zone management programs, including the use of 55 million acres of coastal county wetlands (21 percent of all wetlands in the United States) as they influence land use and ecology.

**Land Use Application:** Helps planners achieve the desired balance between cropping, residential and commercial, fishing, shipping, recreation, wilderness, and wildlife uses which compete for precious space along our finite coastal regions.

### **Environmental Policy Education**

**Purpose:** To provide educational programs related to environmental issues.

**Land Use Application:** Brings into serious consideration at the local level environmental issues which have a profound impact on land use and land use planning. Relates environmental issues to the several national acts which prescribe strict standards for maintaining quality of air and water and which establish procedures for submitting to appropriate agencies for prior approval proposals for programs which might result in undesirable modifications of the environment.

## **LAND USE PROJECTS**

### **Resource, Development and Environmental Economics**

**Purpose:** To provide economic analysis and information for use in resource and environmental decisionmaking, and to project future requirements for natural resources under assumed alternative economic and environmental conditions.

**Land Use Application:** Maintains continuing inventories of resource uses and supplies, and analyzes problems of resource competition and rural-urban land use transition; identifies and evaluates effect of resource controls and resource ownership on resource use, environmental quality, and income distribution; provides long range supply and demand projections on resources for use in land and water planning; and assesses economic impact of environmental controls on agriculture and rural areas.





**WATERSHED STUDIES** utilize weirs to measure actual runoff from specific streams.

### **Natural Resource Planning Assistance**

**Purpose:** To provide assistance on economic aspects of comprehensive river basin planning, to conduct economic evaluations and impact analysis, and to provide technical assistance for Resource Conservation and Development (RC&D) programs, the small watershed program, and to conservation districts.

**Land Use Application:** Provides economic data, analyses, and projections for use in comprehensive river basin planning; analyzes economic benefits from alternative proposed resource development plans; appraises agricultural and rural community water problems; provides policy and technical assistance to the RC&D and small watershed programs; assesses the impact of programs on land use and community economy.

### **Wild and Scenic River Studies**

**Purpose:** To carry on research which will improve the standards for appraising the qualifications of a single river or rivers complex being considered for inclusion in the national wild and scenic river system. To develop improved rating systems that will give comparative analyses of different river systems being considered for inclusion in the national system. To provide a basis for judging the environmental, social, and economic impacts of scenic river systems on adjacent properties.

**Land Use Application:** Develop more appropriate standards for establishing a wild and scenic rivers system that will preserve these precious areas in their natural state as part of America's land use pattern, thereby providing enjoyment and recreation opportunities for thousands of citizens.



**STEMFLOW OF EVERY TREE** on plot is being measured with 24 interception gauges in research studying tree metabolism.

### **Appraisal of Soil Resources**

**Purpose:** To conduct research in soil mapping concerned with identifying the parameters to be measured, including relationships of soil map information to various uses (e.g. crop production, housing developments, zoning). Improved methods of reporting the usable data are being sought.

**Land Use Application:** Judges the crop yield potential, capacity for absorbing septic tank effluent, ability to meet architectural foundation design requirements, suitability for urban planning, susceptibility of soil to frost heave or slippage, bearing strength, soil impermeability, exposure to flood hazards, erosion susceptibility, etc.

### **Alternative Uses of Lands**

**Purpose:** To do research that inventories land uses, develops models for evaluation of benefits, appraises land use requirements, and determines economic effects of certain practices and related external factors. To bring these findings to people through carefully planned and open educational meetings and workshops.

**Land Use Application:** Permits planners and units of government to make informal decisions about adjusting programs and policies, taking into account changing conditions and relative advantage of alternative land uses.

### **Economic and Legal Problems in Management of Water**

**Purpose:** To promote research and conduct educational programs that identify and quantify benefits and costs of water resource development projects. Comparative studies permit choice of better projects for financing; zoning of water bodies and river basins for desirable uses; analysis of losses from flood and water damage;

measurement of multiple use benefits; and determination of potentials, legal arrangements and other characteristics for river and water management schemes.

**Land Use Application:** Achieves better economic management of water resources by establishing guidelines for project clientele.

## **Appraisal of Forest Resources**

**Purpose:** To promote research that sets higher standards for measuring and estimating forest resources, expands use of sophisticated aerial photography and computer technology for data analysis, and seeks other improved survey methodology, such as the laser beam sighting rod used in ground surveys. Appraises the Nation's forest resources in increasing detail and exactness. Analyzes long range timber supply outlook and develops compatible resource programs.

**Land Use Application:** Permits reassessment of management policy on public and private forest lands. Shows where essential timber harvesting, wildlife development and forage production can be carried on and predicts yields that can be expected under various forms of management.

## **Remote Sensing**

**Purpose:** To conduct research that improves information gathering systems.

**Land Use Application:** Permits gathering of natural resource data and direct observation of land uses from the outer atmosphere, substituting an automatic method of securing more accurate data to take the place of slower and less accurate ground surveys.

## **Outdoor Recreation**

**Purpose:** To promote research that determines demand for various kinds of recreational facilities, criteria for site selection, methodology for operating recreation facilities, and estimating management needs and visitor preference for and attitudes about recreation facilities. To conduct educational programs on creative uses of leisure time in outdoor activities.

**Land Use Application:** Guides management in meeting increasing pressure for use of more recreation resources. Methods of operation are enhanced and land use is made more efficient. Educational programs help citizens enjoy recreational land while enhancing and preserving it for future generations.





**FEED FROM WATER WASTES** is being grown in research project which measures depth of water penetration from liquid food wastes applied to field by sprinkler system.

### **Multiple Use Potential of Forest Land and Evaluation of Forestry Programs**

**Purpose:** To carry on research that will seek to improve the response of forest owners to a favorable wood products market and that will analyze their attitudes toward forestry assistance programs that offer management and marketing services. To develop measures that can be taken to supply growing timber demand. Operational guidelines for multiple use management plans will be developed, using basic data on output potentials for timber, wildlife, recreation and other resources.

**Land Use Application:** Provides guidelines to government and forest owners for considering investment opportunities and using more efficient management techniques. Water, forage, recreation and wildlife are also considered as products, in addition to timber. Attention is given to evaluating protection from wildfire, insects and disease, reforestation, timber stand improvement through cultural practices, and new timber harvesting methods as to their effectiveness in promoting forest land use.

### **Improved Income Opportunities in Rural Communities**

**Purpose:** To do research and conduct educational programs on the socioeconomic status of rural areas that

will establish criteria for planning development and analyze potentials for development projects. Factors causing depressed conditions and policies for stimulating community growth will be sought and explained.

**Land Use Application:** Helps make rural areas more attractive to resident populations. Accelerated economic growth in rural areas relieves population pressure in cities. Helps put rural residents more on a par with urban dwellers in per capita income, with concomitant improvement in quality of life.

### **Improvement of Rural Community Institutions and Services**

**Purpose:** To promote research and carry out educational programs on the efficiency of local governments and their services and on interactions with outside services and organizations that will permit those governments to function more effectively. This research and educational effort will conduct and disseminate results of in-depth studies to evaluate and suggest solutions to problems of local services in government, zoning, health, education, sanitation, water systems, etc.

**Land Use Application:** Permits the viable rural communities to serve people more economically, making the rural areas better places in which to live.

### **Research Implementation**

**Purpose:** To provide formal recognition of the need to get research results applied to the land and to provide the mechanism to accomplish this.

**Land Use Application:** New or better land or resource use techniques discovered in research efforts receive

**RESEARCH HAS DISCLOSED** disease-producing particle—a viroid—that causes many diseases of both plants and animals.





NEW HOPE against Dutch elm disease is aroused with research development of pressure technique for injecting chemicals into trees and development of water-soluble form of benomyl which will inhibit fungus within.

increased emphasis and more rapid distribution, through improved communication procedures being developed by the Department, involving publications, electronic media, and other devices.

### **Forest Resource Related Research**

**Purpose:** To find better ways to use the Nation's private and public forest and related open space lands. The goal of research is to learn how man can best use and protect the plant, animal, soil, water, and esthetic resources of nonagricultural lands for his well-being and enjoyment. Equal concern is shown for conservation or renewable resources, for productivity to meet the needs of a growing Nation, and for improvement of the environment. This knowledge provides the basis for sound decisions in land use planning.

**Land Use Application:** Seeks new ways to reduce soil erosion as a major source of sediment and to harvest resources without impairing scenic values; appraises the long range supply and demand for forest products; creates pleasing landscapes and grows trees and shrubs that provide better shelter and protection for man, his home, and his leisure time activities against noise, air pollution or other environmental hazards. Other studies seek ways to expand public recreation facilities and make private recreation enterprises profitable. Research is also aimed at helping resource managers plan and make decisions regarding the multiple uses provided by forest lands.





CONTINUOUS PONDING system has been developed through research to benefit farmers with soil salinity problems. Now being tested is intermittent flooding system which doesn't require extensive releveling of soil to resume irrigation.

RESEARCHER PROBES forest soils with special instruments to determine soil moisture.



## How To Obtain Information

In the preceding pages we have summarized the principal land use planning programs and services offered by the United States Department of Agriculture. These are available to State and local planners, community leaders, legislators and other policy makers. The following additional and more specific information is obtainable, if needed:

*\*To obtain information for a county, conservation district, local trade territory, watershed, or other local area—*

In person or by telephone or letter, request from your local or county office of the Extension Service, other agencies of the Department, State land grant universities, or your local conservation district offices:

1. Summary of Conservation Needs Inventory data for your county.
2. County publications based on inventory data or special interpretations for the data.
3. Soil survey of your county if available.
4. Other soil, water, and plant information, such as aerial photos, forest survey reports, geologic survey maps, and special economic study reports.
5. Levels of local participation in the various programs described in Section II, "Programs Which Affect Land Uses."
6. Educational programs or workshops available (or which can be arranged) for considering basic issues, alternatives, and costs of various land uses and their implementation.

*\*To obtain information for a multicounty area, a State, a group of States, a multistate region, or the mainland United States; for a river basin, a resource conservation and development project area, a planning district, a regional development authority, or a metropolitan, regional, or national trade territory—*

Request from your State USDA office or land grant university (this usually can be done through the local county office of the Extension Service):

1. Summary of Conservation Needs Inventory data for your State or any number of States. (Contains data for each county and State totals.)

2. Statewide publications based on inventory data and interpretative reports.

3. Published soil surveys of counties in any State.

4. Economic, social, timber resource, river basin and similar comprehensive reports prepared by USDA, other government agencies, or special Commissions or Authorities.

5. Computer printouts of inventory data or special tabulations of the data for a land resource region or area.

6. Educational programs, workshops, or periodicals available on land use policies, planning and zoning, and public and private land use issues.





FROM COAST TO COAST in the United States, more views like this are showing up. High-density housing development has gouged out drab sterile areas in wooded countryside. Subdivision shows little evidence of parks or open space.

### USDA Agencies Offering Inventory Data and Programs and Services Helpful in Land Use Planning

- Agricultural Marketing Service (AMS)
- Agricultural Research Service (ARS)
- \*Agricultural Stabilization and Conservation Service (ASCS)
- Cooperative State Research Service (CSRS)
- Economic Research Service (ERS)
- \*Extension Service (ES)
- Farmer Cooperative Service (FCS)
- \*Farmers Home Administration (FHA)
- Forest Service (FS)
- Rural Development Service (RDS)
- Rural Electrification Administration (REA)
- \*Soil Conservation Service (SCS)

*\*These agencies have local offices in nearly every county in the Nation.*